Mississippi Space Grant Consortium
University of Mississippi
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Consortium URL: http://ms.spacegrant.org//
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PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The **Mississippi Space Grant Consortium** is a Designated Consortium funded at a level of **$845,000** for fiscal year 2010.

PROGRAM GOALS

The Mississippi Space Grant Consortium (MSSGC) has three major goals for FY2010-2011 as part of the 5-year Strategic Plan developed to support NASA in pursuit of their education goals and also to detail the Mississippi Space Grant Consortium vision: The Mississippi Space Grant Consortium is a statewide network of sixteen MS Universities and Community Colleges; aerospace-related industries and public service institutions providing opportunities for Mississippians, especially those from underrepresented groups, to understand and participate in NASA's aeronautics and space program by supporting and enhancing science, technology, engineering and mathematics education, research and outreach programs. The three goals for MSSGC are:

1. **Encourage**: The Mississippi Space Grant Consortium Program will provide educational support for STEM students as well as support STEM faculty to provide hands-on activities in their classroom.
2. **Enhance**: The Mississippi Space Grant Consortium Program will support students in their STEM education and help provide them with the knowledge and skills needed for a world-class workforce. This support includes scholarships, fellowships, and internships with aerospace and aerospace-related industries and NASA Centers, as well as hands-on research experiences, and student rocket and balloon hardware programs.
3. **Enlighten**: The Mississippi Space Grant Consortium Program will nurture a scientific literate Mississippi population through minigrants for general public STEM programs and through dissemination of NASA opportunities for the informal education entities and K-12 and higher education teachers.

Tracking information demonstrates that MSSGC continues to make progress in achieving our program goals:

- Percentage of students whom have taken their next step and have been successfully tracked though their next step versus last year of MSSGC support.
    - 88% for 2006
    - 100% for 2007
    - 100% for 2008
    - 100% for 2009
    - n/a for 2010 – all participants sill enrolled

PROGRAM/PROJECT BENEFIT TO OUTCOME (1, 2, OR 3)

- MSSGC FY10 funded a total of 51 students: 34 scholarships and fellowships, and 17 RI students. During the summer of 2011 an additional 18 students will be funded: 10 Industry interns and 8 NASA Centers' interns. (Selections are being made at this time.)

  Of these 51 awards, 22 were made to underrepresented minority students (44%) and 26 awards to female students (51%). This is above the MSSGC benchmark of 39.3% for underrepresented and above the 50% benchmark for females. These percentages will be revised once MSSGC industry and NASA Center interns have been selected. (IES/US Dept of Education stats: MS minority enrollment average of 42%: (42% includes 38.4 Black, .7 Hispanic, .8 Asian, .5 Am Indian and 2.7 Non-resident) MSSGC benchmark goal is 39.3% for minorities since the 2.7% non-resident are not eligible for Space Grant funds.) (Outcome 1)
- The MSSGC Fellowship awardees must complete a K-12 outreach component. MSSGC continues with excellent evaluations from K-12 teachers with the nine MSSGC Fellows and their K-12 outreach activities as part of the Fellowship requirement. Teachers' evaluations were complimentary of the Fellows and their added expertise aiding their curriculum in their classroom. (Outcomes 1 & 2)
- Percentage of students who have taken their next step and have been successfully tracked though their next step versus last year of MSSGC support.
    - 88% for 2006
    - 100% for 2007
    - 100% for 2008
    - 100% for 2009
    - N/A for 2010 – all participants sill enrolled.

MSSGC continues to impact students' STEM education and career pathways. (Outcome 1) The following comments are from students whom were supported during FY10:

"The Space Grant program was a wonderful experience for me. The program was the determining factor, on whether to pursue my degree further. I wanted more experience before entering the workforce, so I decided to get my master's and then a PhD. This is because I wanted to be well-rounded in research skills. I have had several other internships with Stennis Space Center and also currently working on my master's in embedded systems and artificial intelligence." (Tisha Brown - on 02/14/08, 2006 MSSGC Workforce Development Internship, 2006 MSSGC

Workforce Development Internship, 2009 MSSGC Fellowship, 2010 MSSGC Fellowship, 2010 NASA Center Internship/JPL)

"Being an active fellow in the MSSGC program has really expanded my knowledge base and given me experience I would not have gained otherwise. Helping teach scientific based lessons in a local elementary classroom has given me the opportunity to take fairly complex ideas and break them down into manageable topics." (Jairus Bernard - on 08/11/10, 2009 MSSGC Fellowship, 2010 MSSGC Fellowship)

"My participation in the Space Grant program has caused me to desire a career at JPL because of the diverse range of project opportunities there. It has also helped me refine my professional interests, which has implicitly influenced my coursework decisions." (Jacob Bowen - on 07/29/10, 2009 NASA Internship JPL, 2010 NASA Center Internship/JPL, NASA Jet Propulsion Laboratory - Intern)

"The program has put me into direct contact with professors/scientists from various universities around the country and will play a critical role in my choice of graduate school." (Ryan Keith - on 07/28/10, 2009 MSSGC Workforce Development Internship, 2010 MSSGC Workforce Development Internship, NOAA - student employee)

This is an excellent example of internships, fellowships, MSSGC research opportunities retaining students into the NASA "next step" and pipeline.

- MSSGC continues its mutually beneficial relationship with MS industry with the summer student internship program. Industry matches $2,000 per student. FY10 funds will be awarded to 10 students: 5 at Lockheed Martin Space Systems, 2 at NVision Solutions, Inc. and 2 at Radiance Technologies, Inc. and one with a new partnering company: Innovative Imaging and Research, Inc.; all located at NASA/Stennis. (Outcome 1)
- MSSGC/FY10 will support two Community College Faculty at NASA/Stennis as part of the Community College Technology Faculty Summer Fellowship Opportunity. Selections are currently being processed. (Outcome 1) This Community College Opportunity is in alignment with NASA's focus on community college engagement and the program's success is evident by the Community College Faculty participants' evaluations of their experiences this summer. According to both participants from last summer:

  "I have gained an in-depth understanding of Piping and Instrument Drawings (P&IDs) as they are used in industry and in scientific testing of engines that use various fuels; standard installation practices of piping, instrumentation and deluge systems, to include pressures, flow, labeling, and cryogenic safety. This experience has been the highlight of my teaching career so far. I have attended workshops and seminars in the past but they are generally highly structured and don't allow easy access to the people that "do" the work. Working here (NASA/Stennis test stands) has allowed me to interact with both the engineers and the technicians. Generally the interaction with the technicians is missing in workshops and seminars. Since my students will be technicians I found this contact to be most valuable. This enhanced knowledge and firsthand experience will greatly benefit the Electronics Technology and Instrumentation Electronics programs at MS Gulf Coast Community College."

John Poelma, MS Gulf Coast Community College/Electronics Technology Instructor, Summer 2010 at NASA/Stennis.

"The experience here at the E-Complex Test Operations has given me a vast variety of technical information that I can use to improve the quality of my Process Operations Technology program at MGCCC. I have been able to understand the importance of the space program to our nation and the world. I know some groups of our nation leaders are wanting to reduce NASA programs and funding. I believe the technology and all we have learned about our universe in the past 50 years of space flight is irreplaceable. This is why I want to convey to my students the importance of the development of new technologies. We have to keep learning about our universe in order to improve our way of life and the education of our nation and the world." Tommy Conerly, MS Gulf Coast Community College/Instructor, Process Technology, Summer 2009 + 2010 at NASA/Stennis.

- MSSGC continues to fund the student-led rocket and balloon programs at MSU. High Altitude Balloon Project: MSU/Aerospace Dept. utilizes MSSGC funds for an on-going high altitude balloon project as a research platform. FY10 funds were used in the development of a high altitude sailplane to study flight mechanics in the near space environment. MSSGC funds and MSU Space Grant scholars are also supporting high altitude balloon flight by a middle school. This is the first such flight by a pre-college institution in the state. MSU/Rocket Program: MSU also uses MSSGC FY10 funds for the University Student Launch Initiative. The "Space Cowboys" are a student rocket team that has designed and built rockets and participated in the competitive launch at NASA/Marshall and the AIAA Southeastern Region Student Conference yearly. The "Space Cowboys" K-12 outreach component: This rocket team has reached over 1,000 middle school students by a variety of programs: the rocket team conducts a middle school rocket launch challenge that engaged over 40 MS middle school students this year; the team also produced a pre-engineering career video that included NASA careers that was viewed by over than 500 MS middle school students; and other rocket team outreach activities included speaking to over 18 middle school schools. The rocket team also received funds from the Space Grant Foundation to perform a research project in conjunction with NASA Langley and the NASA University Launch Initiative.
- MSSGC continues with a robust RI Program, funding four new projects for $25K each and one new satellite project at $20,000. (Outcome 1)
- MSSGC hosted a middle school STEM workshop for in-service teachers in collaboration with the UM Center for Mathematics and Science Education. This 2-day workshop had 75 MS middle school teachers and included sessions with the NASA Outreach Educator from NASA/Stennis. (Outcome 2)
- MSSGC continues to support and partner with the Rainwater Observatory. MSSGC funded four teacher workshops sponsored by the Observatory: two Backyard Astronomy workshops, a Hands-On Astronomy workshop, and Astronomy to Classroom workshop. These workshops are primarily for MS K-12 teachers, but are also opened to the public. (Outcome 2 & 3)

- MSSGC funded scholarship/fellowship, higher education, K-12, General Public programs at the sixteen MSSGC affiliates. These various programs are conducted by the Campus Coordinator at the MSSGC Affiliate and are all pre-approved by the MSSGC Director. Detailed descriptions are included in the next section. (Outcome 1, 2, & 3)

PROGRAM ACCOMPLISHMENTS

The majority of Mississippi Space Grant's educational programs include scholarships and fellowships, mentored research, Higher Education projects (Outcome 1), K-12 Teacher workshops, and mini-grants (Outcome 2) related to Space Grant program objectives. Our public service programs (Outcome 3) are performed in conjunction with Rainwater Observatory and Planetarium. All of the affiliates' educational programs, K-12 through higher education, are in alignment with state educational standards.

The distribution of NASA funds within the Mississippi Space Grant Consortium for May 4, 2010- May 5, 2011:

Total: $845,000

Scholarships/Fellowships	35.1%		
Higher Education:	25.0%		
Research Infrastructure:	19.3%	Informal Education:	1.2%
K-12:	7.1%	Consortium Admin:	12.4%

Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals. (Employ and Educate)

- 51 students received significant support from FY10 funds; additional 18 awards will be expended when NASA Centers' and partnering industry selects their interns;
    - 34 in Fellowship & Scholarships
    - 13 in /Research Infrastructure programs
- 12 students took next step in FY10 (SG participation supported from FY06-FY10 funds)
    - 5 are pursuing advanced degrees in STEM disciplines
    - 1 accepted a STEM position at a NASA contractor
    - 4 accepted STEM positions in industry
    - 2 accepted STEM positions in K-12 academia

FY 2010 goals met; FY 2010 programs included:

1. MSSGC Workforce Development Program (Higher Education)

The Mississippi Space Grant Consortium (MSSGC) implemented a workforce development program in 2003, expanded the program in 2004, and has continued the program for every summer since 2003. This highly successful program is comprised of a student internship and a community college faculty fellowship program. The MSSGC established partnerships with aerospace-related industries in Mississippi and with NASA Centers that provided ten-week internships for ten undergraduate students and two community college faculty. Selections are currently in progress.

2. Student Internships at NASA Centers

(Applicants solicited by MSSGC; NASA Center chooses participants)

Eight students will be funded for internship this summer at NASA Centers. Selections are currently in progress.

3. Scholarship and Fellowship Programs

A. MSSGC Fellowship Program

MSSGC awarded nine $17,000 fellowships for the 2010-11 academic year. These fellowships may be renewed for up to three years, and support graduate students enrolled at a Mississippi university pursuing any field of graduate study (Masters or Doctoral level) relevant to NASA. MSSGC Grant Fellows are also required to be a resource person to a teacher in one of their graduate institution's neighboring K-12 schools for ten hours per week. Rather than develop teaching modules, the Fellows used already developed materials from the wide variety available through NASA and the NSF-sponsored North Mississippi GK-8 program. Each Fellow attended a one day training workshop at UM in August to provide guidance for K-12 instruction. The applicant also had to describe their graduate research project and how it relates to NASA interests.

Graduate Research Fellowship Program: (MSSGC Competition)

(9) Fellowships @ $17,000 each for 2010-11 awarded to:

- Jairus D. Bernard, MSU/Mechanical Engineering graduate student
- Joshua Aaron Smith, MSU/Mechanical Engineering graduate student
- Nicole Mae Wolgemuth Poe, MSU/ Mechanical Engineering graduate student
- Rachel Wheeler, MSU/Mechanical Engineering graduate student
- Samantha Sabatino, UM/Civil Engineering graduate student
- Margo Nicole Montgomery, UM/Chemistry graduate student
- Michael Hougendobler, UM/Mechanical Engineering graduate student
- Tisha Brown, UM/Computer Science graduate student
- Eowyn Cenek, USM/Computational Mathematics graduate student

B. Affiliates' Fellowship and Scholarship Programs/Space Grant funds

- Alcorn State University

Scholarship: ASU funded ten scholarships to support graduate and undergraduate science majors by awarding fellowships and scholarships for tuition and school expenses. Students were given the opportunity to gain research experiences: they were placed in the laboratory under the supervision of a faculty mentor. The faculty mentor gave the students basic instruction and guidance in scientific research. Students awarded scholarships were assigned to a lab that they help manage under the supervision of a professor, and they work directly under a professor as a research assistant.

- Itawamba Community College

Scholarship: ICC funded seven student scholarships. Awardees were assigned to work with ICC faculty, and also serve as mentors for STEM students.

- Jackson State University

Scholarships/Fellowships**:** JSU funded six scholarships and one fellowship. Awardees were required to meet with their faculty mentor at least 10 hours a week and conduct research as assigned by their mentor.

- Mississippi Delta Community College

Scholarships: Two students were funded to serve as math and science tutors for 2 hours a week for fall and spring semesters in the Center of Learning on campus. Tutoring is

free to any MDCC students and is provided in conjunction with the MDCC Center of Learning.

- Mississippi State University

Fellowship: MSU awarded one fellowship and one scholarship in Aerospace Engineering.

- Mississippi University for Women

Scholarship: One scholarship was funded, after being selected by a STEM committee. The Awardee is required to pursue research at MUW or a host institution and submit a final report of their summer work and give oral presentation at appropriate scientific meetings.

- Northwest Mississippi Community College

Scholarship: One scholarship awardee was selected by NMCC STEM faculty. The awardee assists those in need of support outside the classroom in the areas of science and math.

- University of Mississippi: UM funded one fellowship to a STEM Education (Physics) Master student.
- University of Southern Mississippi

Scholarship**:** USM funds ten scholarships for physics, mathematics or Computer Science students. The students are selected by faculty from these three areas.

4. Research Infrastructure Programs

A. MSSGC Research Infrastructure Program

The Call for Proposals was initiated December 2010 and twelve proposals were received. The MSSGC Review Panel selected five projects in January 2011. Preference was given to projects that related to NASA's research needs, had a strong interdisciplinary team, included new faculty and directly involved students. Project completion date is set for April 30, 2012 for the four projects selected. Projects selected are:

2011 Projects:

- Dr. Judy A. Schneider, MSU/Mechanical Engineering: $25,000; "Evaluation of out-or-autoclave Polymeric Resins for High Pressure, Cryogenic Pressure Vessel Applications" (NASA/Marshall);
- Dr. Paul Scovazzo, UM/Chemical Engineering: $25,000; "RTIL-Membranes for Dehumidification of Gases – Mass Transport and Casting Dynamics for High Fluxing Liquid Membranes"
- Dr. Rani Sullivan, MSU/Aerospace Engineering: $25,000; "Optical Fiber-based Sensors for Structural Health Monitoring of Composite Structures"
- Dr. Lei Cao and Dr. John Daigle, UM/Electrical Engineering: $23,537; "Rateless Wireless Image Transmissions over Space;"

B. Affiliates' Research Infrastructure Programs

- Delta State University

Research Infrastructure: Funds were provided for students to assist DSU faculty in research activities and for presentation expenses at scientific/scholarly meetings.

- Jackson State University

Research Infrastructure: Funds were provided for the research component of the scholarship/fellowship research projects. Some of this amount was used to partially fund travel to scientific meetings to present project papers.

- Mississippi State University

Research Infrastructure: MSU has funded two research infrastructure projects: Transportation Technologies (including rocket propulsion, ground vehicle design and other transportation technologies) and Biomechanics and Impacts. Each project provides a stipend for the undergraduate and graduate students working on their research as well as travel funds to present their projects at scientific meetings.

- The University of Mississippi

Research Infrastructure/Higher Education: UM funded one RI project: Dr. Atef Elsherbeni, UM/Electrical Engineering: $20,000; "Small Satellite Technologies: An Educational Initiative for Ole Miss."

- Mississippi University for Women

Research Infrastructure: MUW funds two faculty research projects and results of the research projects are presented and/or published at professional conferences.

- University of Southern Mississippi

Research Infrastructure: USM funded 5 undergraduate students to work and train on methods of scientific and engineering modeling, simulation, and visualization. The High Performance Visualization Lab at USM was created through the collaborative efforts and funding of the US Navy, US Army and several academic units from the College of Science and Technology. This project was designed to create and maintain a basic knowledge foundation in the lab. This foundation is realized through training a pipeline of graduate and undergraduate students on the basics of modeling, simulation, and scientific and engineering visualization methods and techniques. Additionally, the program is aimed to motivate the creativity of the students and to encourage them to design, build, implement, and improve visualization tools that would be helpful for all researchers who are using the lab facilities. The research coordinator in the lab holds mandatory weekly meetings. In these meetings, discussions are focused on new research ideas, problems and solutions of current research projects and demonstrations of progress reports and presentations.

Outcome 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty. (Educate and Engage)
FY2010 Goals met; FY2010 Programs included:

1. MSSGC Programs: (K-12)

A. MSSGC Annual MSSGC Teachers Conference The workshop was held January 21-22, 2011 at the University of MS. Over 75 middle school teachers (over fifty percent are underrepresented minority teachers) attended, with speakers from the Consortium and its partners presenting topics in mathematics and science. Steve Culivan, NASA Educator, presented two sessions on space science and NASA's vision for the future. Evaluation of each speaker as well as the entire workshop was conducted. Overall, this workshop was evaluated as excellent by participants.

B. MSSGC Minigrants:

- Tupelo High School**:** This project, "Advances in Technology throughout the Ages," included high school student science lectures, research activities, and mentoring program.
- Rainwater Observatory

NASA funds: Projects funded are four teacher workshops: two Backyard Astronomy workshops, a Hands-On Astronomy workshop, and Astronomy to Classroom workshop.

2. Affiliate Programs/ Higher Education and K-12/Space Grant funds**:**

- Delta State University

Higher Education: DSU funded two DSU faculty to attend workshops and/or professional development seminars designed to enhance their teaching skills or to gain current information on an emerging science or technology.

- Hinds Community College

Higher Ed/K-12: HCC awarded (2) undergraduate students to serve as mentors for former and newly recruited participants in the Minority Science and Engineering Improvement Program. These students work closely with mathematics, science, and/or computer science instructors as project/classroom/laboratory assistants. The student mentors provide career choice information, tutoring and assistance with special assignments including science projects.

- Coahoma Community College

Higher Education: CCC funded 3 students who mentor and tutor other CCC students in math, science and/or computer science.

- Itawamba Community College

Higher Education: ICC funded a student assistant to support science faculty in the development of videos, software, and on-line instructional materials. The student assistant also serves as a tutor for science students needing assistance.

- Jackson State University

K-12: Funds were provided for a summer workshop for K-12 teachers in the Jackson area. JSU sponsored a three day workshop for K-12 teachers from the Jackson Public School District. K-12 teachers learned how to conduct scientific experiments, collect, gather, and analyze experimental data and write laboratory reports.

- Meridian Community College

Higher Education: MCC funded a mentoring program, providing a stipend for a computer lab assistant. The student is available for MCC students who need tutoring in the areas of biology and chemistry.

- Mississippi Delta Community College

K-12: MDCC funded a summer workshop for area K-12 science and math teachers. Topics covered included: lab safety, science career paths, and student presentations. The seminar also included sessions to discuss "best practices."

- Mississippi Gulf Coast Community College

Higher Education: MGCCC funded students involved in the cooperative internship with the Gulf Coast Research Laboratory working with an instructor and a student centered project.

- Mississippi State University

Higher Education: High Altitude Balloon Project: MSU/Aerospace Dept. utilizes MSSGC funds for an on-going high altitude balloon project as a research platform. FY10 funds were used in the development of a high altitude sailplane to study flight mechanics in the near space environment. MSSGC funds and MSU Space Grant scholars are also supporting high altitude balloon flight by a middle school. This is the first such flight by

a pre-college institution in the state. MSU/Rocket Program: MSU also uses MSSGC funds for the University Student Launch Initiative. The "Space Cowboys" are a student rocket team that has designed and built rockets and participated in the competitive launch at NASA/Marshall and the AIAA Southeastern Region Student Conference yearly. The "Space Cowboys" K-12 outreach component: This rocket team has reached over 1,000 middle school students by a variety of programs: the rocket team conducts a middle school rocket launch challenge that engaged over 40 MS middle school students this year; the team also produced a pre-engineering career video that included NASA careers that was viewed by over than 500 MS middle school students; and other rocket team outreach activities included speaking to over 18 middle school schools. The rocket team also received funds from the Space Grant Foundation to perform a research project in conjunction with NASA Langley and the NASA University Launch Initiative.
Additional MSU Space Grant/K-12 projects**:** MSU funds a dedicated science lab for the local public school/3rd grades. This lab serves approximately 300 students and 15 teachers. More than two-thirds of the students and half of the teachers are from underrepresented minorities. MSU also funds tours of the MSU engineering laboratories for approximately 100 local high school students. Hands-on activities are included on these tours. Most of these high school students are underrepresented minorities.

- Mississippi University for Women

Higher Education: MUW funded STEM faculty to accompany selected sophomores, juniors, and seniors (based on GPA) to the Mississippi Academy of Science annual meeting and the Mathematical Association of America Louisiana/Mississippi sectional meeting. The intention is to encourage MUW's stronger students to consider graduate and research careers as well as present research papers.

- Mississippi Valley State University

Higher Education: MVSU provided funds for four students and two faculty member to conduct research on student achievement in the local schools in Leflore County (95% underrepresented minorities) and to establish baseline data for placement of MVSU students in college mathematics courses.

- Pearl River Community College

Higher Education**:** PRCC funded a collaborative project with the Alpha Omega Science Club and for all students at PRCC, speakers for science lectures and conference presentations. K-12: PRCC/SG provided funds for the MCTM/PRCC Mathematics Competition held annually on campus. Also, PRCC/SG funded two area high school science teachers to attend NASA workshops.

- University of Southern Mississippi

Higher Education**:** USM funded a spring "Innovative Computing Solution Competition." Students are encouraged to contact local businesses, medical and industrial communities for projects. This goal is to encourage students and motivate their innovation in developing computer solutions and programs in the working environment. Presentations are judged by the School of Computing Faculty.

Outcome 3: Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission. (Engage and Inspire)
FY 2010 goals met; FY 2010 programs included:

- MSSGC Administrative Office:

Increasing the dissemination of NASA and Space Grant activities and information is a continuing focus for the consortium's central office. Eric Day, on contract with the National Space Grant Foundation, serves as the MSSGC Webmaster. The task of dissemination is currently achieved through a variety of mechanisms including email distribution lists, a World Wide Web page, and mailings. NASA announcements and opportunities, as well as other announcements applicable to our shared NASA/consortium goals, are routinely distributed via our email lists and Web page. The consortium's Web site at http://www.ms.spacegrant.org is updated bi-monthly with consortium information, funding opportunities, conference and workshop announcements, and educational links, as well as numerous other links to science, math, and engineering information.

- Rainwater Observatory and Planetarium

Through the MSSGC Mini-grant program, the Rainwater Observatory and Planetarium received four awards for workshops. These workshops are open to the public, although many are designed for K-12 teachers. The director of the Rainwater Observatory is Mississippi's Solar System Educator, Mr. Jim Hill. (See MSSGC K-12 programs in Outcome 2 for descriptions of the four workshops.)

- Itawamba Community College and Meridian Community College

General Public: ICC and MCC each funded a "Backyard Astronomy Program" presented by Jim Hill, Director from the Rainwater Observatory and Planetarium, Mississippi's Solar System Educator, schedule for the ICC and MCC campus April, 2011. The programs are opened to the public and included advertising, and evaluating the event.

- Pearl River Community College

General Public/ Higher Education**:** PRCC/SG in collaboration with the Alpha Omega Science Club provided speaker stipends for guest scientific lecturers. The collaboration hosts several lectures by scientists in different areas whose expertise capture the interest of the student population and expand their horizons. It gives science majors the opportunity to hear from current, informed leaders in their own fields of study; non-science majors are able to relate developments in science and technology to their own disciplines. The general public is also invited to the lecture series.

NASA 2010 Education Priorities

- Authentic, hands-on student experiences: MSU Rocket Program and the High Altitude Balloon Project. Both projects are described in detail in the Outcome 2 section, under Mississippi State University. In addition, students involved with the Research Infrastructure projects are all involved in hands-on research in a variety of STEM areas. Also, FY10 funds have been allocated to Dr. Atef Elsherbeni, UM/Electrical Engineering for the project; "Small Satellite Technologies: An Educational Initiative for Ole Miss."
- Engage Middle School teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise: The MSSGC Teacher Conference is held each year in January for 2 days, for math and science middle school teachers. Steve Culivan, Aerospace Education Specialist from NASA/Stennis is one of the presenters for the science sessions for the first day. Over 75 MS science and math middle school teachers attended this year.

- Community Colleges: MS Community Colleges are an integral part of the MSSGC. They represent eight of the sixteen affiliates and are an active component of the Consortium. Dr. Aleta Sullivan, the MSSGC Campus Coordinator at Pearl River Community College (PRCC) attended the National Space Grant Directors Meeting in Washington, DC this March.
- Environmental Science and Global Climate Change: MSSGC coordinated the NASA Global Climate Change Education Program Workshop held 12/3/2010 at the JSU/MS E-Center in Jackson, MS.
- Diversity of institutions, faculty, and students:
    - The MSSGC consists of 16 affiliates; each campus has a MSSGC Campus Coordinator. The diversity breakdown of the MSSGC Campus Coordinators is 9 males, 7 females; 5 African American, 9 Caucasian and 2 Other. (This represents 43.7% female and 43.7% underrepresented.)
    - All public and private HBCUs and the one public university in the state historically for women are affiliates or education partners of the MSSGC.
    - Benchmarks for diversity for students' awards have historically been met by the MSSGC and continue to remain a priority.
- Enhance the capacity of institutions to support innovative RI activities to enable early career faculty to focus their research toward NASA priorities: The MSSGC Research Infrastructure competition/call for proposals states-"preference is given to projects that are related to NASA, have a strong interdisciplinary team, include new faculty, directly involve students and involve a NASA Center or Enterprise or an aerospace-related company."

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Longitudinal Tracking:

Student Data and Longitudinal Tracking:
Total awards = 51; Fellowship/Scholarship = 34, Higher Education/Research Infrastructure = 17; 44% of the total award represent underrepresented minority F/S funding. NOTE: These percentages will be revised once MSSGC industry and NASA Center interns have been selected.

During the FY10 program year:
5 are pursuing advanced degrees in STEM disciplines, 1 accepted a STEM position at a NASA contractor, 4 accepted STEM positions in industry, and 2 accepted STEM positions in K-12 academia.

For all students that were significantly supported in the period spanning FY06-FY10:
22 are pursuing advanced degrees in STEM disciplines, 3 accepted STEM positions at NASA contractors, 24 accepted STEM positions in industry, 2 accepted STEM positions in K-12 academia, 1 accepted a STEM position in academia, and 1 went on to a position in a non-STEM discipline. The remaining students have not yet received the degree that they were pursuing while the received their Space Grant award.

- Course Development: There were no course development activities this FY10 year. However, there were 3 course revisions:

1, 2: Two instructors from MS Gulf Coast Community College participated in the MSSGC Workforce Development/Community College Technology Faculty Summer Fellowship Program (see pages 3, 4). Tommy Conerly, an instructor in Process Technology and John Poelma, an instructor in Electronics Technology, both reported changes/additions to the content of the courses they teach, specifically in the areas of safety and scientific testing. These changes were a direct result of their experiences at the NASA/Stennis test stands.
3: MSSGC funded one senior design project: Dr. Robert Reece choose an ESMD project, "Universal Wireless Sensor KSC2-11-SD." The NASA technical point of contact was Chris Iannello. (No ESMD funds were used for the project.) The MSU/Electrical Engineering senior design team was formed to attack this problem over the 2010 spring/fall semesters.

- Matching Funds: $658,214 matching funds for FY10. The ratio of funds leveraged by NASA funding support by MSSGC exceeds required match of $610,000 by about 8%.
- Minority-Serving Institutions: All five public Mississippi HBCU's are an active part of the MSSGC. MSSGC has also partnered with the two private Mississippi HBCU's in the state, Rust College and Tougaloo College. Percentage of awards FY10 to underrepresented students is 44% and 51% to female students. NOTE: These percentages will be revised once MSSGC industry and NASA Center interns have been selected.

IMPROVEMENTS MADE IN THE PAST YEAR

- Increased number of MSSGC Fellowships applications.
- Increased the number of MSSGC Industry Student Interns applications.
- Developed a closer partnership with the MS Center for Mathematics and Science Education; the partnership includes the training of the MSSGC Fellows and their K-12 component requirement and providing presenters for the MSSGC Teachers Conference.
- Funded the first student Satellite project in the state at the University of Mississippi.
- Coordinated the NASA Global Climate Change Education Program Workshop held 12/3/2010 at the JSU/MS E-Center in Jackson, MS. This expanded the MSSGC Network and many new contacts were made, most importantly with the MS Department of Education.
- Partnered with another STEM company, Innovative Imaging and Research, Inc. located at NASA/Stennis to participate in the MSSGC Industry Internship Program.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION*

*(Role of affiliates and partners as described in the section "Program Accomplishments.")

Academic Affiliates

The University of Mississippi (UM): Public PhD degree-granting research university and lead institution for the NASA Space Grant Program. Dr. Peter Sukanek is a Professor of

Chemical Engineering and serves as the Director of the MSSGC and UM/MSSGC Campus Coordinator.
The University of Southern Mississippi (USM): Public PhD degree-granting research university. Dr. Joe Whitehead is the Dean and Associate Professor of the College of Science and Technology and is the MSSGC Campus Coordinator.
Mississippi State University (MSU): Public PhD degree-granting research university. Dr. Keith Koenig is a Professor of Aerospace Engineering and the MSSGC Campus Coordinator.
Jackson State University (JSU/HBCU): Public PhD degree-granting research university. Dr. Maria Begonia is a Professor of Biology and the MSSGC Campus Coordinator.
Alcorn State University (ASU/HBCU): Public degree-granting university. Dr. Noland Boyd, Chemistry Professor is the MSSGC Campus Coordinator.
Delta State University (DSU): Public PhD degree-granting university. Dr. Charles Smithhart is a Professor in the Dept. of Biological and Physical Sciences and is the MSSGC Campus Coordinator.
Mississippi University for Women (MUW): Public degree-grant university. Dr. Shaochen Yang is a Mathematics Professor and is the MSSGC Campus Coordinator.
Mississippi Valley State University (MVSU/HBCU): Public degree-grant university. Dr. Raymond Williams is a Mathematics Professor and is the MSSGC Campus Coordinator.
Coahoma Community College (CCC/HBCU): Associate degree-granting community college. Mr. Amick Youngblood is an Instructor in the Dept of Math, Science and Computer Science and is the MSSGC Campus Coordinator.
Hinds Community College (HCC/HBCU): Associate degree-granting community college. Dr. M. Cathryne Jackson is the Chair for the Mathematics & Natural Science Division and is the MSSGC Campus Coordinator.
Itawamba Community College (ICC): Associate degree-granting community college. Dr. Betsy Chesnutt is a Physics and Engineering Instructor and the MSSGC Campus Coordinator.
Meridian Community College (MCC): Associate degree-granting community college. Dr. Angela Carraway is a Chemistry Instructor and the MSSGC Campus Coordinator.
Mississippi Delta Community College (MDCC): Associate degree-granting community college. Amy Biles is a Physical Science Instructor and the MSSGC Campus Coordinator.
Mississippi Gulf Coast Community College (MGCCC): Associate degree-granting community college. Mr. Steve Manis is a Science Instructor and the MSSGC Campus Coordinator.
Northeast Mississippi Community College (NEMCC): Associate degree-granting community college. Mr. Patrick Eaton is the Development Officer and is the MSSGC Campus Coordinator.
Pearl River Community College (PRCC): Associate degree-granting community college. Dr. Aleta Sullivan is a Science Instructor and the MSSGC Campus Coordinator.

Industrial Partners
Alliant (ATK) TechSystems
NVision Solutions, Inc.
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NASA/ Kennedy Space Center
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Educational Partners

Rainwater Astronomy and Planetarium
UM/Center for Math and Science Education
Enterprise for Innovative Geospatial Solutions (EIGS)
Mississippi Science Teachers Association
Mississippi Educational Broadcasting
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